

mRNA EXPRESSION RESPONSE OF ADIPOKINES TO FELINE OBESITY DEPENDS ON ADIPOSE TISSUE LOCATION. H. Van de Velde<sup>a</sup>, G.P.J. Janssens<sup>a</sup>, H. de Rooster<sup>a</sup>, I. Polis<sup>a</sup>, K. Piron<sup>a</sup>, I. Peters<sup>b</sup>, A. Verbrugghe<sup>a</sup>, M. Hesta<sup>a</sup>. <sup>a</sup>Faculty of Veterinary Medicine, Ghent University, Merelbeke, Belgium. <sup>b</sup>School of Veterinary Science, University of Bristol, Bristol, United Kingdom.

Obesity is an emerging problem in many species, including companion animals. Concomitant disorders such as insulin resistance, diabetes mellitus and dyslipidemia are directly or indirectly linked with an increase of adipose tissue (AT). In humans and rodents obesity is associated with enlarged adipocyte cell size, subsequently creating hypoxia in AT. This altered perfusion can result in necrosis whereby macrophages and lymphocytes are attracted. In contrast to the situation in humans and rodents where data on inflammation in AT -explaining the co-morbidities in obesity- exist, this information is lacking in cats. Therefore, AT mRNA expression of chemokines and adipokines was measured in chronically obese cats. The aim of the present study was to increase the knowledge of the development of obesity and related disorders in cats.

Ten chronically obese cats with a mean body weight (BW) of  $6.2 \pm 0.4$  kg and a body condition score (BCS) of  $8 \pm 0.2$  on a 9-point scale were included in this study. Ten lean cats with a mean BW of  $3.9 \pm 0.2$  kg and BCS of  $5 \pm 0.1$  were included as control group. Under general anaesthesia, samples were taken at five different fat depots, namely subcutaneous (SC) abdominal AT, SC inguinal AT, bladder AT, renal AT and omental AT. mRNA expression was determined in the AT using a two-step quantitative real time RT-PCR for leptin, adiponectin, IL-6, IL-10, TNF- $\alpha$ , IFN- $\gamma$ , IL-8, MCP-1 (a chemokine for monocytes) and RANTES (a chemokine for T-lymphocytes). A relative copy number value was calculated for each sample with the results normalised to the three stably expressed housekeeper genes (HPRT1, YWAZ and RPS7). Statistical analyses were performed using a one-way ANOVA for which significance was set at  $P < 0.05$ .

Body weight and BCS was significantly higher in obese cats compared to lean cats ( $P < 0.001$ ). Obese cats showed higher leptin mRNA expression in the five fat depots ( $P < 0.01$ , SC inguinal AT  $P = 0.039$ ), with lower adiponectin mRNA expression in bladder ( $P = 0.017$ ) and renal AT ( $P = 0.047$ ), compared to lean cats. In SC inguinal AT, mRNA expression of obese cats was higher for IFN- $\gamma$  ( $P = 0.045$ ), MCP-1 ( $P = 0.03$ ) and RANTES ( $P = 0.004$ ) than in lean cats. At other AT locations, higher expression of inflammatory cytokines was observed in obese cats compared to lean cats, but they failed to reach the level of significance.

This study indicates that the response of feline AT to obesity is present and differs according to its location. Expression in SC inguinal AT showed most changes, suggesting that this AT location might best reflect the changes in inflammatory and immune status of the obese cat. The increase of RANTES and MCP-1 illustrates the attraction of lymphocytes and monocytes into the AT, which suggests a local inflammation of this latter tissue during feline obesity.